

PATENT ABSTRACTS OF JAPAN

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(54) CONTROLLER FOR INFORMATION RECORDING

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an information recording controller for recording and reproducing information reproduced from a recording medium in a large amount.

SOLUTION: A user selects a recording medium in which voice information which he/she desires to record is recorded and voice information by using a control panel 8 from a menu displayed on a liquid crystal display 6. The user selects similarly a folder in which he/she records the voice information in a MP3 data string area 44 of a hard disk 22 and then recording is started. The designated voice information is retrieved from a specified recording medium and is sequentially recorded in a buffer not illustrated in a CPU 24. The voice information recorded in the buffer is compressed by an encoder and then is recorded in a specified folder in the hard disk 22.

CLAIMS

[Claim(s)]

[Claim 1]An information storage control device comprising:

An information reproduction means which reproduces information recorded on a recording medium.

A conversion method which changes into condensed information information reproduced by said information reproduction means.

An information storage field which records said condensed information changed by

said conversion method.

An output means which outputs at least one side of said condensed information recorded on said information reproduced by said information reproduction means and said information storage field.

[Claim 2] The information storage control device according to claim 1 having a recording device which records said information outputted by said output means.

[Claim 3] The information storage control device according to claim 1 or 2 having a list holding identification information of said at least one condensed information recorded on said information storage field.

[Claim 4] The information storage control device according to claim 3 wherein said list is recorded on said information storage field.

[Claim 5] An information storage control device given in any 1 paragraph of claim 1 wherein said condensed information is recorded on said information storage field by two or more layered structures thru/or claim 4.

[Claim 6] An information storage control device given in any 1 paragraph of claim 1 having further a condensed-information reproduction means which reproduces said condensed information recorded on said information storage field thru/or claim 5.

[Claim 7] An information storage control device given in any 1 paragraph of claim 1 wherein said information is speech information thru/or claim 6.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Art in which an invention belongs] This invention relates to an information storage control device and relates to the information storage control device which reproduces more the information recorded on the recording medium in details.

[0002]

[Description of the Prior Art] Conventionally the speech information recorded on CD-DA of one sheet is usually about 1 hour. Therefore supposing speech information is music around a maximum of ten music is recordable on CD-DA.

When you need the music which needs many CD-DAs and is recorded on a different CD-DA when you need much music it must exchange CD-DA with which a CD-DA player is equipped. There is an autochanger as a device which performs this exchange automatically. An autochanger can be equipped with CD-DA of two or more sheets and CD-DA reproduced automatically can be exchanged for it.

[0003] However if the number of CD-DAs with which an autochanger can be equipped increases and the number of music to need increases namely the size of a device will become large and a price will also become high.

[0004] In this invention it is accomplished in view of the above-mentioned fact.

Therefore it aims at providing the information storage control device which carries out record reproduction of the information reproduced from the recording medium

in large quantities.

[0005]

[Means for Solving the Problem] To achieve the above objects in order to record compressing information reproduced from a recording medium and information by using mass memory storage this invention records information in large quantities and provides an information storage control device which reproduces recorded information. A reproduction means of an information storage control device of this invention reproduces information recorded on a recording medium. A conversion method compresses reproduced information and makes it condensed information. Condensed information is recorded on an information storage field of a recording medium which an information storage control device has. An output means outputs at least one side of condensed information recorded on information and an information storage field which were reproduced by an information reproduction means. Thus in this invention since information reproduced from a recording medium is compressed a storage capacity per [in an information storage field of a recording medium] unit amount of information can be made small and a lot of information than the recordable amount of information can be recorded in conventional technology.

[0006] This device may have a recording device which records information outputted by an output means. That is with an output transmission to a recorder connected or it was built in this device may also be included.

[0007] It may have a list holding identification information of at least one condensed information recorded on an information storage field. Record of condensed information recorded on an information storage field reproduction and an output are also manageable using this list. A list may be recorded on an information storage field.

[0008] When condensed information is recorded on an information storage field it may be recorded by a layered structure which has two or more hierarchies. It may have a condensed-information reproduction means which reproduces condensed information recorded on an information storage field.

[0009] Information may be speech information. At this time voice response which leads a voice loudspeaker may be included in an output.

[0010] Thus in this invention by compressing information currently recorded on a recording medium a storage capacity can be made small and many numbers of information can be recorded on this device rather than information which was conventionally recordable.

[0011]

[Embodiment of the Invention] Hereafter with reference to drawings this embodiment is described in detail.

[Hard structure] The appearance from the transverse plane of the information storage control device concerning this embodiment is shown in drawing 1. This information storage control device contains the hard disk which is not illustrated. Although 8.4 GB (at the time of music reproduction about 140 hours) of hard disk

is used in this example other digital information recorders in which rapid access equivalent to a hard disk or a hard disk with capacity other than 8.4 GB is possible and fast reproduction is possible may be used.

[0012] This device has CD drive 2 which plays CD CD-R drive 4 which records information on CD-R and PC card drive 10 which records information on CompactFlash. It is possible to use various memory cards such as a multimedia card a memory stick etc. connectable with this device and digital memory storage via PC card drive 10. It may have a serial cable port an infrared port etc. as a connector for transmitting information in addition to a PC card drive.

[0013] It has the liquid crystal display 6 in which this device serves as an interface with a user. The user can operate this device by operating the button arranged at the navigational panel 8 and choosing the function displayed on the liquid crystal display 6.

[0014] The block line block diagram of this embodiment is shown in drawing 2. The arrow of a solid line expresses transmission of information and the arrow of the dashed line expresses the direction of control. The hard disk 22 CD drive 2 CD-R drive 4 PC card drive 10 the liquid crystal display 6 and the navigational panel 8 are connected to CPU 24 which has a digital signal processing part. These components are controlled by CPU 24. [Data configuration] As shown in drawing 3 the hard disk 22 has the MP3 data accumulation field 44 and the workspace 46 as an information storage field. An MP3 data accumulation field includes the MUSIC LIST field 48 which is a field which records the list mentioned later.

[0015] The storage structure of the speech information recorded in the MP3 data accumulation field 44 is shown in drawing 4. At this example speech information is recorded by the layered structure which has two or more hierarchies as shown in drawing 4. Here although it has a hierarchy of the music genre 64 the artist 66 the album 68 and the track (music) 70 it is arbitrary what kind of hierarchy is constituted.

[List] It can be simply specified by choosing the list beforehand created by the user which speech information is reproduced or transmitted among the speech information currently recorded in the MP3 data accumulation field 44. It can carry out simply without being based on a list and a user directing detection of the speech information in a hard disk and playback (or transmission) one by one.

[0016] The structure of a list is shown in drawing 5. A list is the form holding the track (music) name as identification information of speech information as shown in drawing 5. However when it aims at treating much speech information like this embodiment though it is a different track a possibility that a track with the same name exists is high. especially the case where a track name is automatically given by this device -- TRACK001 and TRACK002 -- since ... etc. are used this possibility becomes high.

[0017] Only a track name is held at a list and when the track which has the same name exists in several different albums the information storage control device cannot specify the target track. Therefore in this embodiment the identification information (an example album name) of the hierarchy on at least one of the

tracks corresponding to the specified track (this embodiment on one) is also related with a track name and is recorded on a list. That is if a track is specified at the time of list creation an album name will also be related with the track name of the specified track together and will be copied.

[0018] Even when an album name is automatically given by this device the same album name is not given. The same track name cannot be existed in one album. Therefore it is lost by creating a list by the above-mentioned method that a different track is registered with the combination of the same identification information. That is the list can always identify a specific track.

[0019] When searching a track a track is not searched directly but in order to perform album retrieval search time is shortened first. Namely before performing the data retrieval of the bottom of the heap of a layered structure (namely before searching a track) search time is shortened by searching the hierarchy on one of them (namely search of an album deed) and searching the target data (namely track) out of the searched folder (album).

[0020] The list created here is recorded on the MUSIC LIST field 48 in the MP3 data accumulation field 44 in the hard disk 22.

[0021] If it writes in CD-R for every [every / one track / (track-at-once) / a little / two or more / a track] (session-at-once) or every packet (packet writing) it will tie between writing areas and a field will produce. This connector field is useless space from a viewpoint of a storage capacity. The information recorded on created CD-R by existence of this connector field has a case where it is not recognized as speech information but it becomes impossible to reproduce with the usual CD player. According to this embodiment it is based on a list and (disc-at-once) and this connector field become possible [not producing but playing created CD-R with the usual CD player] by transmitting the speech information in a hard disk to CD-R collectively.

[0022] When creating a list the track chosen from the inside of the same album is recorded into the same hierarchy also in a list. Even if chosen by this for a list with two or more tracks same from the same album by it is avoidable that the name of the album same in a list overlaps. That is when a track (music) is chosen and the hierarchy on one of the track of this is already registered into the list the track selected this time is related with the hierarchy on one compulsory already registered not related in order of selection.

[0023] As a list is not limited to the track chosen from the inside of the same album being recorded into the same hierarchy also in a list but is shown in drawing 6 identification information (name of the album which is a hierarchy on one in this embodiment) of the track name which is the identification information of speech information and the hierarchy on at least one may be made into a group and it may register with a list. By using this method in a list it can be lost that the same track name exists the turn of the track in a list can be specified arbitrarily and the turn of reproduction of a track transmission or record can be arbitrarily determined now.

[Operation of this device] An operation of the information storage control device concerning this embodiment is explained to drawing 7 drawing 17 drawing 26 and

drawing 34 with reference to the flow chart shown in drawing 7drawing 17drawing 26and drawing 34. Operation of this device is performed by the user using the liquid crystal display 6 and the navigational panel 8. The display example of a liquid crystal display is shown in drawing 8 thru/or drawing 14drawing 18 or drawing 25drawing 27 or drawing 33 and drawing 35and drawing 36.

[Recording mode] The flow chart at the time of choosing a recording mode is shown in drawing 7. In this recording modeit is the mode which records the speech information recorded on CDCD-Rand CompactFlash on the place of specification of the hard disk 22 according to a user's directions using the liquid crystal display 6 and the navigational panel 8.

[0024]Selection of a recording mode will display the menu for choosing a source deviceas shown in drawing 8. The source device on which speech information (track) to record on a hard disk was recorded is chosen from the source device selection menu 152 shown in drawing 8 in Step 104 by the user. In this examplethe message "Source CD1" which shows that CD1 (it is CD drive 2 in this example) was chosen as a source deviceand CD1 was chosen as the selection display field 154 as a source device by drawing 8 as shown in drawing 9 is displayed.

[0025]Nextas shown in drawing 9the menu for choosing a track to record out of two or more tracks as speech information recorded on the selected source device is expressed to a menu screen as Step 106. In Step 106one track or all the tracks are chosen from the track selection menu 156 shown in drawing 9 by the user. In this examplean additional indication of the message "Tr01" which shows that Track01 was chosen by drawing 9 and Track01 was chosen as the selection display field 154 of drawing 10 is given.

[0026]As shown in drawing 10the menu for choosing the music genre of a track to record out of the music genre registered into the hard disk is expressed as the following step 108. The music genre to which a track to record by a user belongs is chosen from the music genre selection menu 160 shown in drawing 10. In this exampleFavorite is chosen by drawing 10 and an additional indication of "Genre Favorite" is given to the selection display field 154 of drawing 11.

[0027]As shown in drawing 11the menu for choosing the artist of a track who wants to record out of the artist of the selected music genre is expressed as the following step 110. The artist of a track who wants to record by a user is chosen from the artist selection menu 164 shown in drawing 11. In this exampleArtist001 is chosen by drawing 11 and "ArtistArtist001" is displayed on the selection display field 154 of drawing 12.

[0028]As shown in drawing 12the menu for choosing the album of a track to record out of an artist's selected album is expressed as the following step 112. The album of a track to record by a user is chosen from the album selection menu shown in drawing 12. In this exampleAlbum001 is chosen by drawing 12 and "Album Album001" is displayed on the selection display field 174 of drawing 13.

[0029]A judgment is performed [whether the specified track is recorded and] in the following step 114. When a user does the depression of the predetermined button on the navigational panel 8if judged with recording a trackit will progress to

Step 116 and the specified track on a source device is recorded in the album in which the hard disk was specified.

[0030] That is at this step 116 the specified speech information on the selected source device is recorded on the buffer in CPU24 which is not displayed one by one is compressed with an encoder and is recorded on the hierarchy who specified by the above of the MP3 data accumulation field of the hard disk 22.

[0031] In this step 116 the message "Now recording ... Music001" which shows that it is during the record in the case of recording one track on a hard disk during recording processing as shown in drawing 13 is displayed on the record trace field 172. Drawing 14 is the display under record in the case of recording all the tracks in a source device on a hard disk.

[0032] A track name is inputted by the user using the liquid crystal display 6 or the navigational panel 8. When a user does not specify this device sets up a track name automatically. Different names are used for the folder or file (this example track) in the same folder (to inside [This example] of the same album).

[0033] An example of the layered structure of the information storage field before performing the above-mentioned operation to drawing 15 is shown and an example of the layered structure of the information storage field after the above-mentioned operation was performed to drawing 16 is shown. As mentioned above all the tracks of CD1 The music genre of a hard disk "Favorite" Since it was chosen by the user with each menu so that it might record on the folder of an artist "Artist001" and an album "Album001" Although a track does not exist under "Favorite" Artist001 and "Album001" in drawing 15 before operation it turns out in drawing 16 after operation that the track is added.

[0034] Although the specified speech information on a source device was transmitted to the buffer in CPU24 one by one was compressed with the encoder and recorded on the hierarchy by whom the MP3 data accumulation field of the hard disk 22 was specified in the example mentioned above This invention is not limited to this but may record the speech information on a source device on Hurd Thijs 22 temporarily may compress it with an encoder like the account of Gokami and may record it on the hierarchy who specified by the above of the storage region of the MP3 data of the hard disk 22. Although MP3 is used as a compression form of speech information in this embodiment AAC AT RAC3 grade and other compression forms may be used. An encoder may be supplied in hard as a component of an electronic circuit and may be supplied in soft as a program.

[0035] Although one track to record or all tracks were chosen in Step 106 in the above it may enable it to choose two or more arbitrary tracks. It may be made to record the track beforehand specified as the list using the list on a hard disk.

[0036] The arbitrary memory storage which can be connected with this device by the arbitrary recorders which a source device is not limited to the above-mentioned CD but can be built in this device the PC drive 10 or other means may be used.

[Reproduction mode] Next the flow chart at the time of choosing reproduction mode is shown in drawing 17. In this reproduction mode it is the mode which plays

the speech information recorded on the hard disk of this device or CD/CD-R and CompactFlash according to a user's directions using the liquid crystal display 6 and the navigational panel 8.

[0037] Selection of reproduction mode will express the menu for choosing a source device as Step 204 as shown in drawing 18. In this step 204 the source device on which speech information (track) to reproduce from the source device selection menu 252 shown in drawing 18 was recorded is chosen by the user.

[0038] Next in Step 206 if MUSIC LIST is chosen from the source device selection menu 252 shown in drawing 18 by the user processing will progress to Step 218. A judgment is performed [whether reproduction is started and or not] in Step 218. When judged with starting reproduction when a user does the depression of the predetermined button on the navigational panel 8 at Step 220. According to the identification information (album name) which identifies the hierarchy on one of the speech information concerned corresponding to the identification information (track name) of the speech information currently recorded on the list and the speech information concerned speech information (track) is searched from the MP3 data accumulation field 44 and it reproduces.

[0039] When menus other than a list are selected in Step 206 When it is judged that judged whether HDD was chosen from the source device selection menu 252 shown in drawing 18 at Step 208 and HDD was chosen by the user at Step 210. The menu for choosing the music genre of a track to reproduce out of the music genre recorded on the source device chosen as shown in drawing 19 is displayed. In this embodiment the message "Source HDD" which shows that HDD was chosen from the menu shown in drawing 18 as a source device and HDD was chosen as the selection display field 254 as a source device as shown in drawing 19 is displayed.

[0040] The music genre to which speech information (track) to reproduce from the music genre selection menu 256 belongs at this step 210 is chosen by the user. In this example the message "Genre Favorite" which shows that Favorite was chosen from the music genre selection menu 256 shown in drawing 19 and Favorite was chosen as the selection display field 254 of drawing 20 is displayed.

[0041] The menu which chooses the artist of a track who wants to reproduce out of the artist of the selected music genre at the following step 212 is displayed. In this step 212 the artist of a track who wants to reproduce from the artist selection menu 260 shown in drawing 20 is chosen by the user. In this example an additional indication of the message "Artist Artist001" which shows that Artist001 was chosen by drawing 20 and Artist001 was chosen as the selection display field 254 of drawing 21 is given.

[0042] As shown in drawing 21 the menu for choosing the album of a track to reproduce out of an artist's selected album is expressed to a menu screen as the following step 214. In this step 214 the album of a track to reproduce from the album selection menu 264 shown in drawing 21 is chosen by the user. In this example an additional indication of the message "Album Album001" which shows that Album001 was chosen by drawing 21 and Album001 was chosen as the selection display field 254 of drawing 22 is given.

[0043]As shown in drawing 22the menu for choosing a track to reproduce out of the track of the selected album is expressed to a menu screen as the following step 216. In this step 216a track to reproduce from the track selection menu 268 shown in drawing 22 is chosen by the user. In this examplethe message "Track Track01" which shows that Track01 was chosen by drawing 22 and Track01 was chosen as the selection display field 274 of drawing 23 is displayed.

[0044]A judgment is performed [whether the specified track is reproduced and] in the following step 218. If the predetermined button on the navigational panel 8 is looked like [a user doing a depression] and it is judged more with reproducing a trackthe specified track will be searched and reproduced from an MP3 data accumulation field at Step 220.

[0045]In this step 220as shown in drawing 23the message "Now playing...Music001" which shows that one track is under reproduction is displayed.

[0046]In Step 208when it is judged that source devices other than HDD were chosenas shown in drawing 22the menu which chooses the track reproduced out of the track recorded on the selected source device is expressed as Step 216. Subsequent processings are the same as that of the case where HDD is chosen as a source device.

[0047]In Step 216 of this examplewhen source devices other than a list were chosen at Step 204chose the track from the track selection menu 268 only onebut. As shown in drawing 24 and drawing 25after choosing two or more tracks from the track selection menu 268 in Step 216a peach is good as it judges whether it reproduces or not at Step 218. It may enable it to choose all the tracks.

[0048]Arbitrary recorders connectable with this device may build in this device or be sufficient as a source device.

[Transmission mode] The flow chart at the time of choosing a transmission mode is shown in drawing 26. A transmission mode is the mode which transmits the speech information recorded on the hard disk or CD of this device according to a user's directions using the liquid crystal display 6 and the navigational panel 8and is recorded on CD-R or CompactFlash.

[0049]Selection of a transmission mode will display the menu for choosing the source device on which the track to transmit as shown in drawing 27 is recorded. The source device on which speech information (track) to transmit from the source device selection menu 352 shown in drawing 27 at Step 304 was recorded is chosen by the user.

[0050]Nextat Step 306it is judged whether HDD was chosen or not. At this step 306a judgment of what HDD was chosen for by the user will advance it to Step 308. As shown in drawing 28the menu for choosing the music genre of a track to transmit out of the music genre recorded on the selected source device is expressed as this step 308. In this examplethe message "SourceHDD" which shows that HDD was chosen as a source device and HDD was chosen from the source device selection menu 352 of drawing 27 as the selection display field 354 of drawing 28 is displayed.

[0051]The music genre of a track to transmit is chosen from the music genre

selection menu 356 of drawing 28 by the user at Step 308. In this example Genre Favoritewhich shows that Favorite was chosen and Favorite was chosen as the selection display field 358 of drawing 29 is displayed.

[0052]As shown in drawing 29the menu for choosing the artist of a track who wants to transmit out of the artist of the selected music genre is expressed as the following step 310. The artist of a track who wants to transmit at this step 310 from the artist selection menu 360 shown in drawing 29 is chosen by the user. In this exampleArtist Artist001which shows that Artist001 was chosen and Artist001 was chosen as the selection display field 354 of drawing 30 is displayed.

[0053]The menu for choosing the album of a track to transmit out of an artist's album chosen at the following step 312 as shown in drawing 30 is displayed. In this step 312the album of a track to transmit from the album selection menu 366 shown in drawing 30 is chosen by the user. A user's directions (reversing display among a figure) of an album name will display the total of the regeneration time of the speech information (track) included in an album on the sourced rack regeneration time viewing area 364 of drawing 30. In this exampleAlbum Album001which shows that Album001 was chosen from the album selection menu 366and Album001 was chosen as the selection display field 354 of drawing 31 is displayed. The total of the speech information regeneration time included in album Album001 selected is displayed on the sourced rack regeneration time viewing area 364 of drawing 31.

[0054]Nextas shown in drawing 31the menu of a ***** sake is expressed as Step 314 in the destination device which is a device which records the track to transmit. The device which records the track to transmit is chosen from the destination selection menu 372 by the user at this step 314. When CD-R (shown by CD2 with the destination selection menu 372) is chosen as a destination deviceit can be chosen whether the gestalt of the information to record is condensed information (MP3)or it is non compression data (WAV). The recordable time of the destination device (reversing display among a figure) directed by the user is displayed on the destination device recordable time display field 374 of drawing 31.

[0055]At Step 314if a destination device is chosen from the destination device selection menu 372it will be judged in Step 316 whether transmission is started or not. It is searched from the source device as which the track which is Step 318 when judged with starting transmission when a user does the depression of the predetermined button on the navigational panel 8and is transmitted was chosenand it is transmitted to the selected destination device and a track is recorded.

[0056]At Step 306when a list is chosen from the source device selection menu 352 as a source deviceit is Step 314 and the destination device which records a track is chosen from the destination device selection menu 372 of drawing 31. The same processing as the case where HDD is fundamentally chosen with the source device selection menu 352 of Step 306 henceforth is performed. If judged with starting transmissionaccording to the identification information (album name) which identifies the hierarchy on one of the speech information concerned corresponding to the identification information (track name) of the speech information currently

recorded on the list and the speech information concerned. A track is searched from a source device, it is transmitted to the selected destination device, and a track is recorded.

[0057] When devices other than HDD and a list, this embodiment CD, i.e. CD-R, are chosen as a source device, the track in the specified track on a source device or the specified album is once recorded on the workspace 46 in the hard disk 22. When compression processing is required after that, compression processing is performed by the encoder (when a destination device is a CD-R drive and compression is specified), and record is performed to the device selected as a destination device.

[0058] In this embodiment, since the writing in disc-at-once is supported to a CD-R drive, it becomes a flow of the processing which transmits all the tracks which are transmitted the whole album chosen from the album selection menu 366 at Step 312 or were held at the list according to the list, and the processing which chooses the track on a source device is not included. However, between Step 312 and Step 314, as shown in drawing 32, the track on a source device may be chosen from the track selection menu 380, and at Step 314, as shown in drawing 33, a destination device may be chosen from the destination device selection menu 386.

[Edit mode] The flow chart of a list creation procedure is shown in drawing 34. List creation is performed in edit mode. In order to create a list, when MUSIC LIST is chosen from the editorial-contents selection menu 450 which is a menu for choosing the editorial contents shown in drawing 35 at Step 404. As shown in drawing 36, the menu for choosing the music genre of the track registered into a list from the music genres currently recorded on the hard disk is displayed.

[0059] The music genre selection menu 454 is displayed on drawing 36. Since the menu screen in subsequent list creation is the same as the menu screen in reproduction mode, almost omit a graphic display, but. In Step 404, a track is chosen [in / for a music genre / selection and Step 408 / in / for an artist / selection and Step 410] for an album in selection and Step 406.

[0060] It is judged whether the track selected in Step 412 is registered into a list. When the predetermined button on the navigational panel 8 is pushed by the user, when judged with registering with a list, it registers with a list in Step 414 and progresses to Step 416.

[0061] It is judged whether creation of a list is ended in Step 416. When the predetermined button on the navigational panel 8 is pushed by the user and judged with not ending creation of a list, it returns to Step 404. List creation is ended when another predetermined button on the navigational panel 8 is similarly pushed by the user and judged with ending creation of a list in Step 416.

[0062] Here, the created list is recorded on the MUSIC LIST field 48 in the MP3 data accumulation field 44 in the hard disk 22. The identification information (track name) which identifies the track shown to drawing 5 that the identification information held at a list was mentioned above, and the identification information (album name) which identifies the hierarchy on one of the tracks corresponding to a track are associated. The gestalt which forms a hierarchy by the track name and

album name which are shown in drawing 5 may be sufficient as the identification information held at a list and the gestalt which combined the track name shown in drawing 6 and the album name may be sufficient as it. One identification information may be formed by the album name and a track name. When a track name and an album name use it combining the list of two gestalten of list ** of a gestalt in which the list track name and album name of the gestalt which forms a hierarchy are put together. While raising physical track retrieval effectiveness, reproduction and track order specification of record can be enabled.

[0063] A track name is related with the name of the hierarchy (album) on one corresponding to a track and creation progress of the list of a track name and the structure where the name of the hierarchy (album) on one corresponding to a track forms a hierarchy is shown in drawing 37 and drawing 38. When the track of a different album at the time of list creation is chosen as shown in drawing 37, a track name and the album name corresponding to a track are registered into a list as identification information of a track. On the other hand, when another track in the already registered album is specified newly as shown in drawing 38, like the track in the same album registered previously, it relates and registers with an album name.

[0064] Namely ALBUM1 MUSIC4 belonging to 502. It is MUSIC4 when 506 is specified newly. ALBUM1 into which 506 was already registered MUSIC1 which was related with 502 and had already been registered. It is ALBUM1 like 504. It registers with the hierarchy under 502.

[0065] The name of the music genre in the hard disk displayed by the above and a menu screen, the artist, the album and the track must be registered beforehand. The name of the above-mentioned music genre, an artist, an album and a track is automatically added by this device when not registered by the user.

[0066] When registered by the user in edit mode, the name of a music genre, an artist, an album and a track can be registered using the liquid crystal display 6 and the navigational panel 8. Similarly, it is also possible to change a name.

[0067] In edit mode, a user can also create the layered structure in the hard disk which records a track by choosing a hierarchy and creating and deleting a folder. It is also possible to delete the recorded track.

[0068] That is, deletion of change of the name of creation of the folder in the above, a folder and a track, a folder and a track is reflected in the composition of the MP3 data accumulation field 44 in the hard disk 22.

[0069] Although the menu of the GUI display centering on a text is used for drawing 8 thru/or drawing 16, drawing 18 or drawing 25, drawing 27 or drawing 33 and drawing 35 and drawing 36. As shown in drawing 39, the menu indication centering on graphical display may be sufficient or the menu centering on a text may be sufficient.

[0070] Although it is a button, a jog dial may be used for being arranged in this example at the navigational panel 8 instead of a button. When inputting the name of a music genre, an artist, an album and a track, the keyboard connected to this device by an infrared port may be used.

[0071] Search of a lot of speech information and playback can be easily performed

now by managing speech information in a unified manner in this embodiment with the hard disk which is a single mass storage device as explained above and enabling record of compression/non compression data to other recording media. By compressing speech information and recording on a hard disk it becomes unnecessary to be able to store now much speech information (thousands of music) in single memory storage and to use two or more memory storage like before and access to information becomes easy.

[0072] Transmission of the speech information between the storages built in or connected to this device becomes easy by providing "workspace" in a hard disk and using as a buffer storage field. Management of a lot of speech information is made easy by using a layered structure and recording speech information in an information storage field by providing "an information storage field (compressed data record section)" and "a list area (compressed data management domain)." It becomes possible to search required speech information easily out of a lot of speech information by using the list stored in the list area.

[0073] When creating a list by associating and recording the hierarchy (album) on one of the tracks, search of a track becomes easy and a different track with the same name does not produce a conflict. Search accelerates two or more tracks specified in one album by storing in the same folder also on a list. It becomes possible to reproduce a track in the turn registered into the list by registering the index constituted by the list with the name of a track and the name of an album.

[0074]

[Effect of the Invention] Since this invention compresses the information reproduced from the recording medium as described above, the storage capacity per [in the information storage field of a recording medium] unit amount of information can be made small and it has the effect that a lot of information than the recordable amount of information is recordable in conventional technology.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is a front view of the information storage control device concerning this embodiment.

[Drawing 2] It is a block diagram showing the composition of the information storage control device concerning this embodiment.

[Drawing 3] It is a lineblock diagram inside the hard disk shown in drawing 2.

[Drawing 4] It is a figure showing the layered structure in the MP3 data accumulation field shown in drawing 3.

[Drawing 5] It is a figure showing the example of a list of this embodiment.

[Drawing 6] It is a figure showing the example of a list of this embodiment.

[Drawing 7] It is a flow chart which shows the record procedure of this embodiment.

[Drawing 8] It is an example of a source device selection menu screen displayed during the recording operation of this embodiment.

[Drawing 9] It is an example of a track selection menu screen displayed during the recording operation of this embodiment.

[Drawing 10] It is an example of a music genre selection menu screen displayed during the recording operation of this embodiment.

[Drawing 11] It is an example of an artist selection menu screen displayed during the recording operation of this embodiment.

[Drawing 12] It is an example of an album selection menu screen displayed during the recording operation of this embodiment.

[Drawing 13] It is an example of a screen which shows that the speech information displayed during the recording operation of this embodiment is under record.

[Drawing 14] It is an example of a screen which shows that the speech information displayed during the recording operation of this embodiment is under record.

[Drawing 15] It is a figure showing the layered structure in the information storage storage medium before recording music information.

[Drawing 16] It is a figure showing the layered structure in the information storage storage medium before recording music information.

[Drawing 17] It is a flow chart which shows the reproduction procedure of this embodiment.

[Drawing 18] It is an example of a source device selection menu screen displayed during the reproduction operation of this embodiment.

[Drawing 19] It is an example of a music genre selection menu screen displayed during the reproduction operation of this embodiment.

[Drawing 20] It is an example of an artist selection menu screen displayed during the reproduction operation of this embodiment.

[Drawing 21] It is an example of an album selection menu screen displayed during the reproduction operation of this embodiment.

[Drawing 22] It is an example of a track selection menu screen displayed during the reproduction operation of this embodiment.

[Drawing 23] It is an example of a screen which shows that the speech information displayed during the reproduction operation of this embodiment is under reproduction.

[Drawing 24] It is an example of a track selection menu screen displayed during the reproduction operation of this embodiment.

[Drawing 25] It is an example of a track selection menu screen displayed during the reproduction operation of this embodiment.

[Drawing 26] It is a flow chart which shows the transmission protocol of this embodiment.

[Drawing 27] It is an example of a source device selection menu screen displayed during transmission operation of this embodiment.

[Drawing 28] It is an example of a music genre selection menu screen displayed during transmission operation of this embodiment.

[Drawing 29] It is an example of an artist selection menu screen displayed during transmission operation of this embodiment.

[Drawing 30] It is an example of an album selection menu screen displayed during

transmission operation of this embodiment.

[Drawing 31] It is an example of a destination device selection menu screen displayed during transmission operation of this embodiment.

[Drawing 32] It is an example of a track selection menu screen displayed during transmission operation of this embodiment.

[Drawing 33] It is an example of a screen displayed during transmission operation of this embodiment.

[Drawing 34] It is a flow chart which shows the list creation procedure of this embodiment.

[Drawing 35] It is an example of an edit class selection menu screen of this embodiment.

[Drawing 36] It is an example of a music genre selection menu screen of this embodiment list in preparation.

[Drawing 37] It is a figure showing the example of list creation of this embodiment.

[Drawing 38] It is a figure showing the example of list creation of this embodiment.

[Drawing 39] It is a figure showing the modification of the menu screen of this embodiment.

[Description of Notations]

2 CD drive

4 CD-R drive

6 Liquid crystal display

8 Navigational panel

10 PC drive
